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TITLE: Molecular Biology of Breast Neoplasia

PRINCIPAL INVESTIGATION: Dr. V. Craig Jordan

CONTRACTING ORGANIZATION: Northwestern University Medical School
Chicago, Illinois 60611

REPORT DATE: October 1996

TYPE OF REPORT: Annual

PREPARED FOR: Commander
U.S. Army Medical Research and Materiel Command
Fort Detrick, Frederick, Maryland 21702-5012

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13. ABSTRACT (Maximum 200) The Robert H. Lurie Cancer Center is an NCI funded (2P30 CA60553-04) clinical cancer center. The Cancer Center has established a premier breast cancer program with significant strengths in both basic and clinical research. The US Army funded training grant "Molecular Biology of Breast Neoplasia" enables four predoctoral students and one postdoctoral trainee per year to be exposed to the latest concepts in the biology, diagnosis and treatment of breast cancer. Members of the training program participate in a weekly Journal Club and a monthly breast cancer research meeting. Each trainee will present their research as a seminar during the upcoming year. The intense training received by the students will put them in an ideal position to pursue careers in breast cancer research to hopefully develop new strategies in the treatment and prevention of breast cancer.				
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FOREWORD

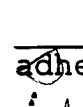
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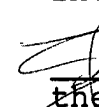
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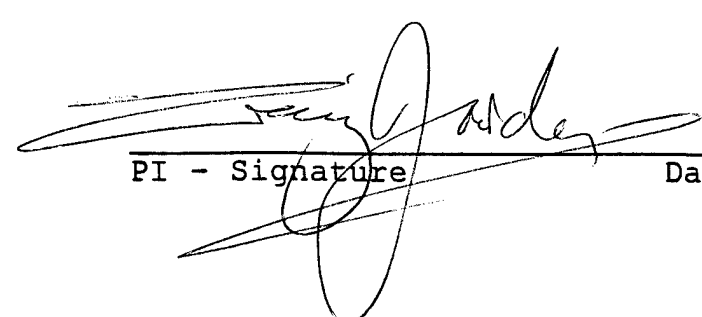
 In conducting research using animals, the investigator(s) adhered to the "Guide for the Care and Use of Laboratory Animals," prepared by the Committee on Care and use of Laboratory Animals of the Institute of Laboratory Resources, national Research Council (NIH Publication No. 86-23, Revised 1985).

 For the protection of human subjects, the investigator(s) adhered to policies of applicable Federal Law 45 CFR 46.

 In conducting research utilizing recombinant DNA technology, the investigator(s) adhered to current guidelines promulgated by the National Institutes of Health.

 In the conduct of research utilizing recombinant DNA, the investigator(s) adhered to the NIH Guidelines for Research Involving Recombinant DNA Molecules.

 In the conduct of research involving hazardous organisms, the investigator(s) adhered to the CDC-NIH Guide for Biosafety in Microbiological and Biomedical Laboratories.


PI - Signature

10/4/96
Date

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Army Report 1996

INTRODUCTION

The Robert H. Lurie Cancer Center is an NCI-designated clinical cancer center. The Cancer Center integrates clinical and laboratory research at the Medical School and its five affiliated hospitals and in the basic science departments located on the Evanston Campus. The Cancer Center is dedicated to promoting excellence in cancer research, prevention, diagnosis, treatment and rehabilitation, as well as to the education of scientists, health professionals and the community. The Center provides an environment that encourages the rapid application of new technology to patient care. The affiliated hospitals treat a total of 5,000 cancer patients each year.

The Cancer Center has worked diligently to establish a premier breast cancer program at Northwestern University. Dr. V. Craig Jordan is director of the breast cancer laboratory research program. Dr. Monica Morrow directs the clinical breast cancer research program and the Lynn Sage Comprehensive Breast Center at Northwestern. The Center has state-of-the-art mammography facilities, education and medical exam facilities. An Analytical Laboratory under the direction of Dr. Jordan was established recently to measure hormone levels in patient samples. In September 1994, the Lurie Cancer Center received an award from the NCI to establish a breast cancer program (NCI 1P20 CA65764). The co-principal investigators of this grant were Drs. Jordan and Morrow. In August, 1996, the Cancer Center was the recipient of one of three four year breast center grants from the US Army (UIS CC950011) entitled, "Increasing Access to Modern Multidisciplinary Breast Cancer Care". Other research accomplishments include 6 grants from the US Army Breast Cancer Research Program, interactive RO1's focused on hormonal and nutritional aspects in breast cancer prevention, an RO3 grant to establish the Y-ME support group on the Internet, and Illinois Department of Public Health Cancer Research Grants on breast cancer prevention, early detection and translational research.

BODY

In September, 1994, the Lurie Cancer Center received a four year grant from the US Army for training of graduate students who are conducting breast cancer relevant research entitled, "Molecular Biology of Breast Neoplasia". The objective of the program is to provide a sound training in breast cancer biology and to encourage the use of the powerful tools of contemporary molecular biology, genetics and chemistry to unravel the fundamental mechanisms of breast neoplasia. The program enables students to be exposed to an outstanding basic science faculty with research interests relevant to breast cancer and to clinical investigators who can make this work translational.

In June, 1995, the Cancer Center applied for a supplement to the Training Grant through the National Action Plan on Breast Cancer (NAPBC), Public Health Service's

Office on Women's Health. The Center received an award to support 3 postdoctoral positions, one per year.

The Northwestern University goal to develop a research and clinical breast cancer program has been achieved under the direction of Dr. V. Craig Jordan and Dr. Monica Morrow. Their accomplishments in basic and clinical research provide the students in the breast cancer training program with a new environment to learn and develop their skills. Since the training grant cannot support students throughout their laboratory experience, we have chosen to maximize our resources to encourage and develop those students who have already gained laboratory skills in their first and second years of study and who wish to learn more about breast cancer. Therefore, students in their third, fourth and fifth years of study are eligible for the program. These students are already gaining laboratory and research skills from their mentors and benefit the most from the additional training in the breast cancer program. Postdoctoral students must be no more than three years past their Ph.D. training.

The Breast Cancer Journal Club, under the direction of Dr. Jordan, brings together the diverse interests in breast cancer on a weekly basis to discuss relevant journal articles and areas of research (see Appendix). The Training Grant students are required to participate in the journal club. Dr. Jordan leads the discussion where a student presents a selected breast cancer topic from the basic and clinical literature. Although there are only five allocated positions on the Army grant, the journal club regularly attracts 10-20 graduate, postdoctoral and faculty participants.

To enhance the research program, Dr. Jordan also conducts a monthly breast cancer research meeting to bring together the diverse interests in breast cancer on the Northwestern campuses in Chicago and Evanston (see Appendix). At the meetings, faculty review progress on their research. There are 40 to 50 audience participants.

In addition to the Journal Club and research program meetings, students attend numerous seminars and journal clubs. These include the Tumor Cell Biology Seminar Series (see Appendix), Cell and Molecular Biology Seminars, Molecular Endocrinology Seminars and the new Translational Research Seminar Series. In addition, the Cancer Center sponsored the visit of the leading breast cancer research specialist Dr. Marc Lippman (see Appendix) last November. There is also the upcoming Schweppe Colloquium in the Basic Sciences which will focus on cancer susceptibility genes and cancer genes. One of the speakers, Dr. Richard Wooster, will speak on the breast cancer susceptibility gene BRCA2 (see Appendix).

In year 1 of the Training Grant, the following four students received funding:

<u>Name</u>	<u>Principal Investigator</u>	<u>Department</u>
S-J Teng	Daniel Linzer, Ph.D.	BMBCB

Sameer Mathur	Richard Morimoto, Ph.D.	BMBCB
M. Shanmugam	Mary Hunzicker-Dunn, Ph.D.	Cell & Mol Biology
Julie McLachlan	Ouahid Bakouche, Ph.D.	Molec Pharm & Biological Chem

BMBCB Biochemistry, Molecular Biology and Cell Biology

In year 2 of the Training Grant, the four predoctoral students and one postdoctoral fellow who received awards included:

<u>Name</u>	<u>Principal Investigator</u>	<u>Department</u>
Ann Buchmann	Bayar Thimmapaya, Ph.D.	Micro-Immuno
Stephanie Hsu	Noel Bouck, Ph.D.	Micro-Immuno
Todd McAdams	Terry Papoutsakis, Ph.D. William Miller, Ph.D.	Chem Engineering
M. Shanmugam	Mary Hunzicker-Dunn, Ph.D.	Cell & Molec Biol
Zehan Chen, Ph.D.	V. Craig Jordan, Ph.D.	Cancer Center

Two of the students have recently presented their results at national meetings and submitted manuscripts. Malathy Shanmugam, who was supported for two years by the Training Grant, recently submitted a manuscript on her research entitled, "Regulation of the Protein Kinase C Delta Isoform by Estrogen in the MCF-7 Human Breast Cancer Cell Line". Ms Shanmugam research focuses on the expression and regulation of the PKC isoform delta in estrogen receptor positive MCF-7 cells and in receptor negative MDA-MB 231 breast cancer cells. Treatment of MCF-7 cells with estrogen was found to down-regulate PKC delta mRNA and protein. The same dose of estrogen was maximally proliferative for the MCF-7 cells. Treatment of the MCF-7 cells with phorbol ester and DiC8, both of which lead to growth arrest, lead to PKC delta activation. The results suggest that activated PKC delta isoform may signal to initiate/maintain the growth arrest of breast cancer cells.

Stephanie Hsu, the student from Dr. Noel Bouck's laboratory, recently presented her work at a Cold Spring Harbor meeting on Cancer Genetics and Tumor Suppressor Genes. Her abstract was entitled, "Chromosome 10 controls a major angiogenic switch in the progression of human glioblastomas via thrombospondin". Malignant glioblastomas frequently involve the loss of a tumor suppressor gene on chromosome 10. Ms. Hsu showed that returning a normal chromosome 10 to three different glioblastoma multiforme cell lines reversed their tumorigenicity and ablated their

angiogenic phenotype. The loss of angiogenic stimulation was due to the production of thrombospondin-1, a potent inhibitor of angiogenesis. Anti-thrombospondin antibodies completely reverse this inhibition. The angiogenic stimulation was mainly due to vascular endothelial cell growth factor (VEGF), as anti-VEGF antibodies destroyed the stimulatory activity. Angiogenesis also plays a role in the progression of breast cancer, as a number of angiogenic factors such as TGF alpha and VEGF are produced by these tumors. Thrombospondin is produced by normal breast epithelial cells, but is lost in breast tumors. Therefore, Stephanie's work has direct relevance to breast cancer.

Todd McAdams, who is working in the laboratories of Drs. Terry Papoutsakis and William Miller, is currently working on the preparation of a manuscript of his research entitled, "Effects of Culture pH on Erythroid-Lineage CD34⁺ Peripheral Blood Cells". Todd is looking at optimization of culture pH for improving the expansion of peripheral blood stem cells from breast cancer patients who are undergoing peripheral blood stem cell transplantation. Cell differential counts of CD34⁺ peripheral blood cells in culture with growth factors indicate a dramatic enrichment in late-stage erythroid cells as pH increases. Total cell production at low pH, however, was less than half that at standard pH. Western blots confirm the absence of erythroid specific proteins from cultures maintained at low pH. The results suggest a possible block in erythroid differentiation at low pH.

Zehan Chen, Ph.D., the postdoctoral fellow funded through the Training Grant, is using the technique of differential display to search for genes differentially expressed in estrogen receptor positive (T47D:A18) and estrogen receptor negative (T47D:C4:2) breast cancer cell lines. Since these two cell lines were derived from the same parental T47D cell line, the genes differentially expressed may provide some lead to the potential mechanism of the down regulation of the estrogen receptor in ER negative cells. Preliminary screening has revealed a few genes which are expressed at different levels between the two cell lines. These results have been confirmed by Northern blot analysis. The expression level of IG3 is about 2-3 times higher in ER negative cells. In contrast, 7C2 is expressed at high levels in ER positive cells, but at low levels in the ER negative clone. Partial sequence data suggests that 7C2 may be a novel not previously identified gene.

In year 3, the four predoctoral students and one postdoctoral fellow who were selected to receive awards include:

<u>Name</u>	<u>Principal Investigator</u>	<u>Department</u>
Ann Buchmann	Bayar Thimmapaya, Ph.D.	Micro-Immuno
Kristi Miller	Sigmund Weitzman, M.D.	Medicine
Jennifer MacGregor	V. Craig Jordan, Ph.D.	Cancer Center

Jennifer Sanders

Paula Stern, Ph.D.

Molec Pharm &
Biol Chem

Sonia Cerda, Ph.D.

Sigmund Weitzman, M.D.

Medicine

Ms. Buchmann is continuing on her research project, "Regulation of Gene Expression by pRb Using a Novel Approach" which was funded for a second year. Ann is looking at the effects of retinoblastoma (Rb) tumor suppressor gene on the expression of the cell cycle related genes. She constructed an adenovirus vector which is capable of expressing Rb at high levels. Her experiments showed that E2F-1 and -2, two members of the E2F family of transcription factors are down regulated by Rb. This suggest that the primary target of Rb is E2F-1 in cell proliferation control. She also found that one of the inhibitors of cyclin D/cdk 4, p16 is down regulated by Rb, suggesting that there is an autoregulation of the activation of Rb during cell proliferation. Ann is now repeating these same experiments in normal human fibroblasts and in Bt549 breast cancer cells to determine whether transcriptional control is cell type specific or whether there are any changes due to cell transformation. She is currently preparing a manuscript describing her results.

Kristi Miller is studying the role of the transcriptional coactivator, p300 in breast cell morphogenesis in vitro. An understanding of the process normal breast cells undertake in morphogenesis should be valuable in understanding breast cancer progression. Since the ability to form structures is lost early in malignant cells, factors controlling morphogenesis may help to explain the mechanisms involved in malignancy. p300 is a nuclear phosphoprotein involved in breast differentiation. Phosphorylation of p300 is correlated with activation of c-jun transcription. Kristi is attempting to identify phosphorylation sites on the p300 molecule that are linked to breast cell morphogenesis. Kristi has also demonstrated that expression of a mutant p300 protein completely blocks duct formation in vitro.

Jennifer MacGregor is studying the differential effects of estrogen and antiestrogens and their effect on growth and gene regulation in T47:A18 (ER positive) and T47D:C4:2 (ER negative) breast cancer cell lines. These subclones were derived in Dr. Jordan's laboratory from the parent T47D human breast cancer cell line. Jennifer will determine expression levels and mutational status of the p53 tumor suppressor gene and BRCA1 breast cancer gene in the T47:A18 and T47D:C4:2 cell lines. She will also transiently and stably transfect ER cDNA into the each of the subclones and look at estrogen and antiestrogen responsiveness. Her results should provide important information about the role of the ER in the progression from hormone dependent to hormone independent growth.

Jennifer Sanders is a student who previously has received a predoctoral fellowship from the US Army Breast Cancer Research Program. Ms. Sanders is examining the effects of tamoxifen and estrogen on bone. Experimental and clinical studies suggest that tamoxifen acts like an estrogen on bone, promoting the conservation of bone tissue.

She hopes to determine whether estrogen and tamoxifen act on the protein kinase C signal transduction pathways in bone cells. The protein kinase C pathway is a major signaling pathway in bone cells and is responsive to estrogen in other tissues. Further studies to examine the specificity of the effects, whether these effects are at the transcriptional level, which PKC isozymes are involved and the consequences of antagonism of specific PKC isozymes on estrogen and tamoxifen actions will be carried out. Jennifer has published some of her results already in the Journal of Bone and Mineral Research and has made several presentations of her research at national meetings.

The postdoctoral fellowship award was made to Dr. Sonia Cerda who works in the laboratory of Dr. Sigmund Weitzman. Dr. Cerda is studying the role of the DNA repair enzyme, N-methyl-purine-glycosylase (MPG) in breast cancer. This enzyme is responsible for the removal of the mutagenic DNA lesion, 8-hydroxyguanine, caused by oxygen radical injury. This gene has been found to be overexpressed in breast cancer tissue samples tested by Dr. Cerda. Her data suggests that overexpression of this gene might contribute to breast cancer development through imbalanced repair or might be utilized as a protective mechanism by breast cancer cells. She will study the regulation of this enzyme in response to oxidative stress in normal human breast epithelial and breast cancer cell lines and will utilize transgenic mouse techniques to examine whether overexpression can lead to development of breast cancer.

CONCLUSIONS

The breast cancer program at the Robert H. Lurie Cancer Center provides an exceptional environment to promote and advance the research potential of committed individuals. The program has successfully attracted talented students interested in conducting research in breast cancer and has provided them with the appropriate foundation and background knowledge base. The goal is to enhance the future pool of trained investigators to contribute actively to breast cancer related problems.

The overall goal in the final two years of the Training Grant is to focus intense attention on the requirements for published work. Dr. Jordan has established a mechanism for student seminars to review the research progress of each student and to provide advice about the preparation of publications.

APPENDIX MATERIAL

ROBERT H. LURIE CANCER CENTER
BREAST CANCER PROGRAM
JOURNAL CLUB SCHEDULE

Tuesdays 11-12 Vanderwicken Library Olson 8260

September 24	Kala Tanjore
October 1	Julie Yang
October 8	Ana Levenson
October 15	Todd McAdams
October 22	Ann Buchmann
October 29	Joanne McAndrews
November 5	Malathy Shanmugam
November 12	Sonia Cerda

BREAST CANCER RESEARCH PROGRAM

All sessions will be held in the Vanderwicken Library, Olson Pavilion at 3:00 pm

Presentation Schedule

- Monday, April 8, 1996 3:00 pm - Dr. Barry Gehm "Site Directed Mutagenesis of estrogen Receptor"
- Monday May 6, 1996 R. Chatterton - "Development of hormone assays for epidemiological studies of premenopausal women"
- Monday June 10, 1996 Dr. Murthy - Animals Models of Breast Cancer Metastases
- Monday July 8, 1996 Agostino Molteni "Cytostatic properties of ACE Inhibitors"
Peter Gann "Mitogenic Growth factors in nipple aspirates"
- Monday August 5, 1996 Mimi Rodin "Breast Cancer Screening among Indochinese immigrant women"
- Monday September 9, 1996 Jonathan Jones (3-1412) "Hemidesmosomes and breast epithelial cells"
- Monday October 28, 1996 Ann Thor Breast Cancer Research at Evanston Hospital
- Monday December 9, 1996 Bill Lowe - Dominant negative growth factor receptors and breast cancer

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Sixth Annual Schweppe Colloquium

***Cancer Susceptibility Genes
and Cancer Gene Therapy***

Monday and Tuesday
October 28 and 29, 1996
Chicago, Illinois

Robert H. Lurie Cancer Center
of Northwestern University

presents

The Sixth Annual
Schweppe Colloquium
in the Basic Sciences

**CANCER SUSCEPTIBILITY
GENES AND CANCER
GENE THERAPY**

**Monday and Tuesday
October 28 and 29, 1996**

Northwestern University
Thorne Auditorium
Chicago, Illinois

Colloquium Organizer

Bayar Thimmapaya, PhD
Lurie Cancer Center and
Department of Microbiology-
Immunology, Northwestern University
Medical School

The Robert H. Lurie Cancer Center of
Northwestern University is a National
Cancer Institute-designated clinical
cancer center.

Robert H. Lurie
Cancer Center of
Northwestern University
presents

Cancer Susceptibility Genes and Cancer Gene Therapy

**Monday,
October 28, 1996**

8:00 a.m.
Registration and
continental breakfast

8:25 a.m.
Welcome
Steven T. Rosen, MD, FACP
Director
Robert H. Lurie
Cancer Center of
Northwestern University

**8:30 a.m. to
12:00 Noon**
Morning Session

Tumor Suppressor Genes

Session Chair
Sigmund A. Weitzman, MD
Chief, Division of
Hematology-Oncology
Northwestern University
Medical School

8:30 to 9:15 a.m.
*The Multifunctional Nature
of p53*

Carol Prives, PhD
Department of Biological
Sciences
Columbia University

9:15 to 10:00 a.m.
*Tumor Suppressor Gene
Mutations in Mice*

Tyler Jacks, PhD
Howard Hughes Medical
Institute
Massachusetts Institute
of Technology

10:00 to 10:30 a.m.
Coffee Break

10:30 to 11:15 a.m.
*Functional Properties of
the Wilms' Tumor Gene
WT1*

Daniel Haber, MD, PhD
Harvard Medical School
Cancer Center
Massachusetts General
Hospital

**11:15 a.m. to
12:00 Noon**
*Tumor Suppressor Genes:
From Childhood Eye Tumors
to Adult Breast Cancer*

Wen-Hwa Lee, PhD
Institute of Biotechnology
University of Texas
Health Science Center
at San Antonio

12:00 to 2:00 p.m.
Lunch (on your own)
Poster Set-up

2:00 to 5:20 p.m.
Afternoon Session

Cancer Genetics

Session Chair
Susan L. Cohn, MD
Division of Pediatric
Hematology-Oncology
Northwestern University
Medical School and
Children's Memorial
Medical Center

2:00 to 2:45 p.m.
*Early Events in Colon
Carcinogenesis*

Ray White, PhD
Department of
Oncological Sciences
Huntsman Cancer Institute
University of Utah

2:45 to 3:30 p.m.
*Hypermethylation,
Chromatin Changes, and
Tumor Suppressor Gene
Inactivation*

Stephen Baylin, MD
Cancer Biology Division
Johns Hopkins Oncology
Center

3:30 to 3:50 p.m.
Coffee Break

3:50 to 4:35 p.m.
*Evidence for Genetic
Predisposition to Prostate
Cancer*

William Isaacs, MD
Department of Urology
Johns Hopkins University
School of Medicine

4:35 to 5:20 p.m.
*The Cloning of the Breast
Cancer Susceptibility
Gene BRCA2*

Richard Wooster, PhD
Sanger Centre,
Wellcome Trust
United Kingdom

5:20 to 7:00 p.m.
**Poster Session and
Reception**

Robert H. Lurie Cancer Center
of Northwestern University
presents the Sixth Annual
Schweppe Colloquium
in the Basic Sciences

Cancer Susceptibility Genes and Cancer Gene Therapy

Poster Session

A poster session will give Colloquium participants who are conducting research in cancer genetics and cancer gene therapy an opportunity to present results of their work. If you plan to present a poster, please send a one-page abstract, including a complete list of authors and their institutional affiliations; format is one typewritten page, double-spaced, 12-point type, with one-inch margins. Please send your abstract, along with your Colloquium registration, by Friday, October 4, 1996; post-doctoral trainees and students who meet this deadline may register at reduced rates as indicated below.

Fees

The following fees apply to all who attend the Schweppe Colloquium: full fee: \$60.00; postdoctoral trainees: \$35.00; students: \$25.00. Registration fee includes Colloquium materials and continental breakfast and coffee breaks each day. All students and postdoctoral trainees must provide written confirmation of their status from a program director or faculty advisor. All attendees who register onsite on October 28 or 29 will be assessed an additional \$20.00. **Postdoctoral trainees and students who send poster session abstracts by Friday, October 4, 1996, may register at reduced rates as follows: \$25.00 (postdoctoral trainees); \$15.00 (students).**

Refunds

If it is necessary for you to cancel your registration, the fee will be refunded in full, but only if written notice is received at the Lurie Cancer Center by **Monday, October 21, 1996.**

Lodging

Rooms have been reserved at two hotels, listed below. To reserve a room at the reduced rate, when making your reservation please mention that you are attending the **Northwestern Schweppe Conference**. Colloquium attendees should contact the hotel directly and are encouraged to make room reservations by **Monday, September 30, 1996**; otherwise, rooms are subject to availability and regular rates will apply.

Holiday Inn City Centre

300 East Ohio Street, Chicago, IL
Tel.: 312.787.6100
Rates: \$190.00 single; \$210.00 double

Motel 6 Downtown

162 East Ontario Street, Chicago, IL
Tel.: 312.787.3580
Rates: \$79.00 single; \$89.00 double
If you wish to fax a room request, fax number is 312.787.2354; on your fax, please include arrival and departure dates as well as credit card number and authorized signature.

Conference Location

The Schweppe Colloquium and poster session will be held at Northwestern University's Thorne Auditorium, 375 East Chicago Avenue, Chicago. The auditorium is a short walk from the Holiday Inn City Centre and Motel 6 Downtown; taxis are also available.

Parking

Self-pay parking is available at 221 East Superior Street. To reach Thorne Auditorium from the parking garage, leave from the Superior Street pedestrian entrance and walk one and one-half blocks east.

Additional Information

Denise Barca, Colloquium Coordinator
Tel.: 312.908.5258 Fax: 312.908.1372
E-mail: rky@merle.acns.nwu.edu

**Tuesday,
October 29, 1996**

8:30 a.m.
Continental breakfast

9:00 a.m. to 12:30 p.m.
Morning Session

Cancer Gene Therapy

Session Chair
Bayar Thimmapaya, PhD
Lurie Cancer Center
and Department of
Microbiology-Immunology,
Northwestern University
Medical School

9:00 to 9:45 a.m.
*Suicide Genes for
Cancer Therapy*

Michael Blaese, MD
Gene Therapy Branch
National Center for Human
Genome Research
National Institutes of Health

9:45 to 10:30 a.m.
*Multidrug Resistance as a
Selectable Marker for
Gene Therapy*

Michael M. Gottesman, MD
Laboratory of Cell Biology
National Cancer Institute

10:30 to 11:00 a.m.
Coffee Break

11:00 to 11:45 a.m.
*Molecular Genetic
Interventions for Human
Cancer*

Gary J. Nabel, MD, PhD
Howard Hughes Medical
Institute
University of Michigan

11:45 a.m. to 12:30 p.m.
*Gene Therapy Targeted
by Ionizing Radiation*

**Ralph Weichselbaum, MD,
PhD**
Department of Radiation
Oncology
University of Chicago

Registration

Cancer Susceptibility Genes and Cancer Gene Therapy

The Schweppe Colloquium
sponsored by the
Robert H. Lurie
Cancer Center of
Northwestern University

**Monday and Tuesday
October 28 and 29,
1996**

Thorne Auditorium
375 East Chicago Avenue
Chicago

Full fee is \$60.00. Fee for
postdoctoral trainees is
\$35.00, and for students,
\$25.00. Postdoctoral train-
ees and students who send
poster session information

by Friday, October 4, 1996,
may register at a reduced
rate of \$25.00 (postdoc-
toral trainees) or \$15.00 (stu-
dents). When sending reg-
istration, trainees and stu-
dents must include an
accompanying letter con-
firming their status from a
program director or faculty
advisor. **Make checks pay-
able to Lurie Cancer Cen-
ter; mail this panel with the
registration fee to**

Lurie Cancer Center
Northwestern University
Olson 8250
710 North Fairbanks Court
Chicago, Illinois 60611-3013
Tel.: 312.908.5258
Fax: 312.908.1372
E-mail:
rky@merle.acns.nwu.edu

Name _____

Title/position _____

Department _____

Institution _____

Street Address _____

City/State/ZIP _____

Daytime phone/fax/e-mail _____

Registration fee enclosed \$ _____

I will pay by Visa _____ MasterCard _____ AMEX _____

Card number _____

Expiration date _____

Signature _____

I am a student or postdoctoral trainee. A letter from my program
director or faculty advisor confirming my status is enclosed.

____ yes

I plan to participate in the Colloquium poster session. An ab-
stract is enclosed.

____ yes

14D

Marc E. Lippman, MD
Inaugural Lynn Sage Visiting Professor

Sponsored by :
Northwestern Memorial Hospital
Northwestern University Medical School
Robert H. Lurie Cancer Center Breast Program

Arrive: Tuesday November 14, 1995 - 2:00 pm. Take taxi to hotel to register

Accommodation: Drake Hotel
140 E. Walton, Chicago, IL 60611 - (312) 787-2200
Confirmation Number: 1299843
met by Dr. Jordan at 3:30 pm to walk to the hospital

Tuesday, November 14, 1995

5:00 - 6:00 pm **Inaugural Lynn Sage Lecture**

Title: *Prospects for the Biological Therapy of Breast Cancer*
Location: Offield Auditorium, Passavant Pavilion 108

7:00 pm Dinner in honor of Dr. Marc Lippman
Charlie Trotter's - 816 W Armitage Ave., (312) 246-6228

Guests: Bill Gradishar, MD, Director Fellows Training Program Medical Oncology
Craig Jordan PhD, DSc, Director, Breast Cancer Research Program
Monica Morrow, MD, Director, Lynn Sage Breast Center
David Nahrwold, MD, Chair, Department of Surgery
Claudia Tellez, MD, Medical Oncology Fellow
Marty Watterson, Chair, Molecular Pharmacology
Sigmund Weitzman, MD - Chair, Medical Oncology

Wednesday, November 15, 1995

8:30 am Fellows Breakfast - Drake Hotel
Vasilios Assikis, MD
Malcolm Billimoria, MD
Zehan Chen, PhD
Ana Levinson MD, PhD
Debra Tonetti, PhD

11:00 - Noon R. H. Lurie Cancer Center Breast Program Lecture

Title: *The EGF Superfamily of Receptors and Ligands in Breast Cancer*
Location: Vanderwicken Library, Olson Pavilion 8260

12:30 Lunch: Avazare 161 E. Huron - Craig Jordan, Monica Morrow, Steve Rosen (Cancer Center Director)

Return Washington: Wednesday November 15, 1995 4:45 pm

**DEPARTMENT OF PATHOLOGY AND THE ROBERT H. LURIE CANCER CENTER
TUMOR CELL BIOLOGY AND CARCINOGENESIS SEMINARS**

THURSDAYS VANDERWICKEN LIBRARY OLSON 8260 1:00 P.M.-2:00 P.M.

FALL 1996

October 3	Anjana Yeldandi, M.D., Assistant Professor, Department of Pathology <i>TBA</i>
October 10	Richard Burt, Assistant Professor, Department of Medicine <i>TBA</i>
October 17	Dante Scarpelli, M.D., Ph.D., Professor, Department of Pathology, NUMS <i>Genetic Alterations During Pancreatic Duct Carcinogenesis</i>
October 24	Julia Sensibar, Assistant Professor, Department of Urology, NUMS <i>TBA</i>
October 31	Karin Klein, Assistant Professor, Department of Preventive Medicine, NUMS <i>Molecular Epidemiology: What Breast Cancer Risk Factors May Reveal About Breast Cancer Biology</i>
November 7	Suzanne Norvell, Tumor Cell Biology Student, NUMS <i>TBA</i>
November 14	Andreas Matouschek, Assistant Professor, BMBCB, NU <i>TBA</i>
November 21	<i>TBA</i>
November 28	Thanksgiving Holiday
December 5	Sharon Stack, Department of Obstetrics and Gynecology, NUMS <i>Extracellular Matrix Regulation of Metastasis-Associated Proteinases</i>
December 12	Debra Tonetti, Assistant Professor, Cancer Center, NUMS <i>Investigation of the PKC Signal Transduction Pathway as it Relates to Tamoxifen-Resistant Breast Cancer</i>
December 19	<i>TBA</i>
December 26	Christmas Holiday